بروزجهرا

Subject: Date: Sa Su Mo Tu We Th Fr

کلاس عادی جلسه ۲۱

① $\underbrace{1!=1 \quad 3!=6}_{7} \quad \underbrace{2!=2 \quad 4!=24}_{6} \Rightarrow 7\times 6 = \boxed{④}$

② الف) $\sqrt[4]{(4+\sqrt7)^{-1}}\;(1+\sqrt7)^2 = \sqrt[4]{\frac{2(4+\sqrt7)}{4+\sqrt7}} = \boxed{\sqrt[4]{2}}$

ب) $\left(\frac{\sqrt2+\sqrt5}{\sqrt{10}+2}\times\frac{\sqrt{10}-2}{\sqrt{10}-2}\right)\left(\sqrt{3-\sqrt5}-\sqrt{3+\sqrt5}\times\frac{\sqrt2}{2}\right)$

$= \frac{\sqrt{6-2\sqrt5}-\sqrt{6+2\sqrt5}}{2} = \frac{\sqrt5-1-\sqrt5-1}{2} = -1$

③ الف) $\frac{2\sqrt2+3\sqrt3}{5-\sqrt6}\times\frac{5+\sqrt6}{5+\sqrt6} = \frac{\cancel{19}(\sqrt2+\sqrt3)}{\cancel{19}} = \sqrt2+\sqrt3$

$-2\left(\frac{1}{\sqrt3-1}\right)\times\frac{\sqrt3+1}{\sqrt3+1} = -2\,\frac{\sqrt3+1}{2} = -(\sqrt3+1)$

$\Rightarrow \sqrt2+\sqrt3-\sqrt3-1 = \boxed{\sqrt2-1}$

ب) $\frac{3\sqrt3-1}{4+\sqrt3}+(2-\sqrt3)^{-1} = \frac{3\sqrt3-1}{4+\sqrt3}\times\frac{4-\sqrt3}{4-\sqrt3}+\frac{1}{2-\sqrt3}\times\frac{2+\sqrt3}{2+\sqrt3}$

$= \sqrt3-1+2+\sqrt3 = \boxed{2\sqrt3+1}$

④ الف) $\frac{\sqrt{4+\sqrt3}+\sqrt{\sqrt3-1}}{\sqrt{\sqrt3-\cancel{\sqrt2}}}\times\frac{\sqrt{\sqrt3+\sqrt2}}{\sqrt{\sqrt3+\sqrt2}} = (\sqrt{1+\sqrt3}+\sqrt{\sqrt3-1})\sqrt{\sqrt3+\sqrt2}$

$= \sqrt{\left((\sqrt{1+\sqrt3}+\sqrt{\sqrt3-1})(\sqrt{\sqrt3+\sqrt2})\right)^2} = \sqrt{(2\sqrt3-2\sqrt2)(\sqrt3-\sqrt2)} = \sqrt{(\sqrt6-2)^2}$

$\sqrt6-2 \quad -2 = \boxed{\sqrt6-4}$

Subject: $\sqrt[3]{2^2}$ Date: کوثر شاه بنی

Sa Su Mo Tu We Th Fr

ب) $\cancel{(2^{\frac{8}{3}})^{\frac{1}{4}}} \times \sqrt[4]{2} \times 2\sqrt[12]{2} = \sqrt[12]{2^8} \times \sqrt[12]{2^3} \times 2\sqrt[12]{2} = 2\sqrt[12]{2^{12}} = \boxed{4}$

---

5) $$\frac{3^x(1+3+3^2+3^3+3^4+3^5)}{2^{x-2}(1+2+2^2+2^3+2^4+2^5)} = 52$$

$$\frac{3^x \times 364}{2^{x-2} \times 63} = 52 \Rightarrow \frac{3^x}{2^{x-2}} = \frac{52 \times 63}{364} \Rightarrow \frac{3^x}{2^{x-2}} = \frac{3^2}{2^0}$$

$\Rightarrow \boxed{x = 2}$

---

6) $(a-b)^2(a+b)^2 = t(2-\sqrt{3}) \Rightarrow (a^2-b^2)^2 = t(2-\sqrt{3})$

$\Rightarrow \sqrt{6} - 2 + \sqrt{6} + 2 - 2\sqrt{3} \Rightarrow 2(\sqrt{6} - \sqrt{3}) = t(2-\sqrt{3})$

$$\Rightarrow t = \frac{2(\sqrt{6}-\sqrt{3})}{2-\sqrt{3}} \times \frac{2+\sqrt{3}}{2+\sqrt{3}} = 2(\sqrt{6}-\sqrt{3})(2+\sqrt{3}) = 4\sqrt{6}+10\sqrt{2}$$

---

7) $[(a+\frac{1}{a}+\sqrt{2}) \times (a+\frac{1}{a}-\sqrt{2})]^2 = (A^2-B^2)^2 = ((a+\frac{1}{a})^2-(\sqrt{2})^2)^2$

$7-4\sqrt{3}+2+\frac{1}{7-4\sqrt{3}}$ $\qquad \frac{1}{7-4\sqrt{3}} \times \frac{7+4\sqrt{3}}{7+4\sqrt{3}} = \frac{7+4\sqrt{3}}{49-48}$

$= a^4 + 2 + \frac{1}{a^4} = 2^t \Rightarrow 9-4\sqrt{3} + \frac{1}{7-4\sqrt{3}} = 2^t$

$= 9 - \cancel{4\sqrt{3}} + 7 + \cancel{4\sqrt{3}} = \boxed{16}$

$= 16 = 2^t \Rightarrow 2^4 = 2^t \Rightarrow \boxed{t = 4}$

Subject: Date: کوثر عابدینی

Sa Su Mo Tu We Th Fr

$$(۸)\quad A = ۴^{\frac{۱}{۵}} \times ۲^{\frac{\frac{۴}{۳}}{۵}} \times ۲^{\frac{۴}{۳}} = ۲^{\frac{۲}{۵}} \times ۲^{\frac{۴}{۱۵}} \times ۲^{\frac{۴}{۳}} = ۲^{\frac{۳۰}{۱۵}} = ۲^{۲} = \boxed{۴}$$

$$(۲A)^{-\frac{۱}{۳}} = (۲ \times ۴)^{-\frac{۱}{۳}} = \left(\frac{۱}{۸}\right)^{\frac{۱}{۳}} \Rightarrow \sqrt[۳]{\frac{۱}{۸}} = \boxed{\frac{۱}{۲}}$$

$$(۹)\quad \sqrt[۷]{a} = ۲۷ \times a^{\frac{۱۵}{۷}} \Rightarrow \frac{a^{\frac{۱۵}{۷}}}{a^{\frac{۱}{۷}}} = \frac{۱}{۲۷} \Rightarrow \frac{۱}{۲۷} = a^{\frac{۱۴}{۷}}$$

$$\Rightarrow a^{۲} = \frac{۱}{۲۷} \Rightarrow a = \sqrt{\frac{۱}{۲۷}} \Rightarrow a = \frac{\sqrt{۳}}{۹} \checkmark$$

$$\Rightarrow \frac{۱}{a} - ۳ = \frac{۹}{\sqrt{۳}} - ۳ = ۳\sqrt{۳} - ۳$$

$$\Rightarrow \frac{۳(\sqrt{۳}-۱)}{\sqrt{۳}+۱} \times \frac{\sqrt{۳}-۱}{\sqrt{۳}-۱} = ۶ - ۳\sqrt{۳}$$

$$(۱۰)\quad A - B = ۲ \Rightarrow A^{۲} - B^{۲} = (x+۵) - (x-۴)$$

$A \to \sqrt{x+۵}$, $B \to \sqrt{x-۴}$

$$A^{۲} - B^{۲} = x + ۵ - x + ۴$$

$$A^{۲} - B^{۲} = ۵ + ۴$$

$$\Rightarrow (A-B)(A+B) = ۵ + ۴ \Rightarrow ۲(A+B) = ۵ + ۴ \Rightarrow A + B = \frac{۵+۴}{۲}$$

$$\underbrace{\sqrt{x+۵} + \sqrt{x-۴}}_{A+B} - ۲$$

$$\Rightarrow \frac{۵+۴}{۲} - \frac{۴}{۲} = \boxed{\frac{۵}{۲}}$$